

Application No. 10/635,401
Amendment dated June 23, 2005
Reply to Office Action of February 23, 2005

REMARKS

Reconsideration of this application is requested. The claims presented for reconsideration are original claims 1 – 64.

Claims 65 – 131 are canceled.

I. Claim Rejections - 35 U.S.C § 102(b)

All claims were rejected under 35 U.S.C. § 102(b) as being anticipated by Janssen et al. (U.S. Patent 6,121,503). The rejection is respectfully traversed.

As described in paragraph 0009 of the specification, the propylene-containing compositions of the claimed invention are designed for use in applications requiring low levels of impurities, such as polymerization processes. Applicants have found that propylene containing a concentration of 0.5 to 2 vppm of dimethyl ether can be used for processes requiring polymer grade propylene. Because oxygenates in general interfere with the catalysts used during a polymerization process, it would be expected that DME would also pose these problems. Unlike other oxygenates, however, applicants have found that dimethyl ether can be tolerated at higher concentration levels during a polymerization process. Based on this unexpected finding, claims 1 – 64 provide compositions suitable for use in a polymerization process that contain a) at least 95 vol. % propylene; b) at least 0.5 vol. % propane; and c) from 0.5 to 2 vppm dimethyl ether.

Conventionally, polymer grade propylene must contain low levels of oxygenate impurities to avoid interference with the catalysts used during a polymerization process. Included with this response is a purity specification for polymer grade propylene by Sinopec Shanghai Petrochemical Company Limited. This purity specification, which was reproduced from Sinopec's website at <http://www.spc.com.cn/enspc/spc/pslook.php?Did=73&Cid=54&Dlev=2>, provides an example of conventional purity requirements for polymer grade propylene. Dimethyl ether is not listed in this purity specification. However, both oxygen and methanol are listed. In the purity specification, both oxygen and methanol are required to be below 1 volume part per million. ("mL/m³" and "mg/kg" are both part-per-million equivalents.) This is in contrast to the claimed

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invention of claims 1 – 64, where up to 2 vppm of dimethyl ether can be present while still using the claimed propylene-containing composition for a polymerization process.

The propylene-containing compositions of the claimed invention are not inherently described by Janssen et al. Janssen et al. describes a production process for propylene, including polymer grade propylene. Janssen et al. does not describe the concentration of any impurities in the propylene-containing composition. Therefore, one of skill in the art would expect Janssen et al. to adopt a conventional definition of a polymer grade propylene, such as the purity specification from Sinopec Shanghai Petrochemical Company Limited. Janssen et al. confirms the use of the conventional definition by describing polymer-grade propylene as propylene characterized by very low concentrations of impurities. (See Col. 2, lines 22 – 25.) As part of the conventional definition, one of ordinary skill in the art would understand Janssen et al. as describing propylene compositions with low levels of oxygenates, such as dimethyl ether.

Based on the above, Janssen et al. does not anticipate the propylene compounds of the claimed invention, either explicitly or inherently. As noted by the Examiner, Janssen et al. does not describe a propylene-containing composition having 0.5 to 2 vppm of dimethyl ether, as required by the claimed invention. As shown above, the conventional definition of a polymer grade propylene composition would not include 0.5 to 2 vppm of dimethyl ether, as conventionally it would be desirable to maintain as low a concentration of oxygenates (such as dimethyl ether) as possible. Because Janssen et al. adopted this conventional definition, Janssen et al. does not inherently disclose the dimethyl ether concentrations described by the claimed invention.

Additionally, the oxygenate feed starting materials and processing conditions described in Janssen et al. are not substantially identical to the conditions provided by the claimed invention. Janssen et al. describes an oxygenate to olefin reaction to produce a high purity olefin product without needing to conduct separations on the product. This is the finished product described in Janssen et al. By contrast, in various embodiments, the product of an oxygenate to olefin reaction is described as the “initial effluent” in the specification for the claimed invention. (See, for example, paragraphs 0020 – 0023.) In these embodiment, the “initial effluent” is used as the

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starting material and processed to produce the compositions of the claimed invention. For at least these reasons, the processes described in Janssen et al. and the specification for the claimed invention are not substantially identical, and therefore do not support the Examiner's assertion that Janssen et al. inherently possesses the features of the claimed invention. For at least these reasons, reconsideration and withdrawal of the rejection are respectfully requested.

II. Claim Rejections - 35 U.S.C. § 103(a)

The Office Action also rejected the claims, in the alternative, under 35 U.S.C. § 103(a) as being unpatentable over Janssen et al. This rejection is also respectfully traversed.

Janssen et al. not only does not describe or suggest the claimed invention; additionally, Janssen et al. teaches away from the compositions of the claimed invention. Janssen et al. discusses the impurity levels in high purity olefins and polymer-grade propylene at Col. 2, lines 1 – 25. Dimethyl ether is listed as one possible low-level impurity which requires removal in order to avoid interference with polymerization catalysts. No other indication is given of acceptable impurity levels.

The claimed invention provides propylene-containing compositions, having a dimethyl ether concentration of from 0.5 to 2 vppm, as suitable compositions for use in polymerization reactions. These non-obvious, novel compositions reduce the required costs for purification of propylene containing compositions when used for polymerization reactions. By contrast, Janssen et al. teaches one of ordinary skill in the art that dimethyl ether should be minimized or eliminated in a propylene containing composition for use in a polymerization reaction. Instead of suggesting the claimed invention, Janssen et al. teaches away from the non-obvious, novel compositions of the claimed invention. For at least these reasons, reconsideration and withdrawal of the rejection are respectfully requested.

III. Conclusion

Having demonstrated that the cited reference fails to disclose the invention as claimed, this application is in condition for allowance. Accordingly, applicants request early and favorable reconsideration in the form of a Notice of Allowance.

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If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated, since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response. Please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1712 (Docket #: 2003B081).

Respectfully submitted,



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Date: June 23, 2005

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Sinopec Shanghai Petrochemical Company Limited
Refined Oil Products

(See <http://www.spc.com.cn/enspc/spc/pslook.php?Did=73&CId=54&Dlev=2>)

Product Name:	Polymer Grade propylene												
Trade Mark:	Sanren Brand												
Alternative Name:													
Molecular formula/Structural Formula:	C ₃ H ₆												
Production Process:	Using straight-run kerosene and diesel distillates,naphtha and hydrogenated tallings as raw material,the product is produced in a pipe cracking heater and obtained through cryogenic separation.												
Properties:	Propylene is a colourless inflammable and explosive gas with active chemical properties. When mixed with air, it could be an explosive with the explosive limits between 2.0-11.1 Vol.%, flash point -108D,spontaneous ignition point 455D. Its density is slightly higher than that of air. It is easy to disperse. The critical temperature is 91.4D and the critical pressure 4600kPa.												
Grade:													
National Standard Grade:													
Enterprise Standard Grade:													
Specifications:	<div>Q/SH 012.01.11-93 (Enterprise Standard)</div> <table><tr><td>No.</td></tr><tr><td>Item</td></tr><tr><td>Quality Criteria</td></tr><tr><td>Testing Method</td></tr><tr><td>1</td></tr><tr><td>propylene Content, %(v/v) >=</td></tr><tr><td>99.6</td></tr><tr><td>GB /T 3392</td></tr><tr><td>2</td></tr><tr><td>Paraffins , %(v/v) <=</td></tr><tr><td>0.4</td></tr><tr><td>GB /T 3392</td></tr></table>	No.	Item	Quality Criteria	Testing Method	1	propylene Content, %(v/v) >=	99.6	GB /T 3392	2	Paraffins , %(v/v) <=	0.4	GB /T 3392
No.													
Item													
Quality Criteria													
Testing Method													
1													
propylene Content, %(v/v) >=													
99.6													
GB /T 3392													
2													
Paraffins , %(v/v) <=													
0.4													
GB /T 3392													

	3
Ethylene, mL/m ³ <=	
	30
	GB /T 3392
	4
Acetylene, mL/m ³ <=	
	1
	GB /T 3395
	5
Allylene+allene mL/m ³ <=	
	5
	GB /T 3392
	6
Oxygen mL/m ³ <=	
	1
	GB /T 3398
	7
Carbon monoxide, mL/m ³ <=	
	1
	GB /T 3394
	8
Carbon dioxide, mL/m ³ <=	
	5
	GB /T 3394
	9
Butene, mL/m ³ <=	

	<div>1</div> <div>GB /T 3392</div> <div>10</div> <div>Butadiene, mL/m³ <=</div> <div>1</div> <div>GB /T 3392</div> <div>11</div> <div>Sulphur, mg/kg <=</div> <div>1</div> <div>GB /T 11141</div> <div>12</div> <div>Water, mL/m³ <=</div> <div>6</div> <div>GB 7716</div> <div>13</div> <div>Hydrogen, mL/m³ <=</div> <div>15</div> <div>GB /T 3393</div> <div>14</div> <div>Methanol, mg/kg <=</div> <div>1</div> <div>GB /T 12701</div>
Scope of Application:	
Major Applications:	The product is mainly used for the production of polypropylene. It is also a basic raw material for organic synthesis.

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Process Method:	
Packing:	Bulk
Packing Size:	
Storage:	Spherical tank
Transportation:	Pipe transfer, or by means of a special vessel and special tank truck.
Safety Precautions:	<p>1. Propylene is an inflammable and explosive substance. During storage and transportation, safety precautions against fire and explosion must be taken. At the same time, keep away from fire, heat sources and sunlight.</p> <p>2. Special tank truck must be used for transportation. In compliance with the relevant Government Ordinance concerning hazardous chemicals, due formalities must be gone through for the permission of transportation. Static electricity discharger must be provided to prevent static electricity from being accumulated. Fire fighting device must be equipped as well.</p> <p>3. Propylene is anesthetic. When its concentration in the air reaches to a medium level, it could make people lose their consciousness. We should prevent ourselves from being contacted by liquefied propylene for frostbite. Guard against leakage during storage and transportation.</p>